

Business Models for open data (ecosystems)

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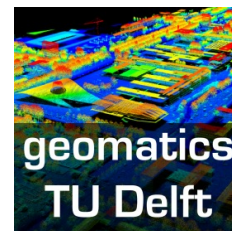
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Brief introduction

- Assistant Professor at Delft University of Technology
- Researcher attached to Knowledge Centre Open Data
- Coordinator of 2 MSc Geo Courses
- Partner in 3 international research projects

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GIMA
Geographical Information Management and Applications





Overview of this presentation

- Introduction to business model theory
- Potential value propositions for open data organizations
- New insights / developments



Business model definition

“Abstract representation of an organization (in particular a National Mapping & Cadastral Agency), be it conceptual, textual, and/or graphical, of all core interrelated architectural, co-operational, and financial arrangements designed and developed by an organization presently and in the future, as well as all core products and/or services the organization offers, or will offer, based on these arrangements that are needed to achieve its strategic goals and objectives”

(Al-Debei, M.M. & D. Avison 2010)

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Business models are frameworks

“method of doing business by which a company can sustain itself - i.e. to generate revenue”
(Rappa 2003)

“derived from an organization’s mission and strategy and contain the logic and rationale to generate value” (Keen & Qureshi, 2006)

“describes and explains how an organization creates, delivers, and captures value”
(Osterwalder & Pigneur 2010)



Business models aspects

- often associated with generating revenue
- can also aim at generating public value
- will only be successful if they are able to adapt to a changing environment

Some business model misconceptions

- Business model \neq business case
 - A business case is a justification for undertaking a project to obtain funding
- Business model \neq a value proposition
 - part of the service domain
- Business model \neq a revenue model or pricing mechanism
 - part of the financial domain

Business model components, STOF model

(Bouwman et. al 2005)

MARKET DYNAMICS
e.g. changing customer demands,
competition

What?; to whom?;
Why?; with which
capacity?

**TECHNOLOGICAL
ADVANCEMENTS**
e.g. Ambient awareness

**TECHNOLOGY
DOMAIN**
Functionality
required

**SERVICE
DOMAIN**
Value proposition
Market segment

**FINANCIAL
DOMAIN**
Cost structure
Profit potential

NETWORK VALUE
e.g. Revenues

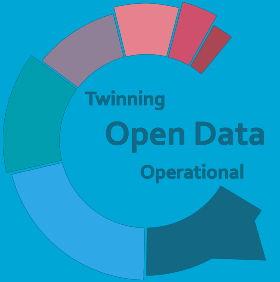
**ORGANIZATION
DOMAIN**
Structure of value
network

e.g. Ease of use,
costs, experience

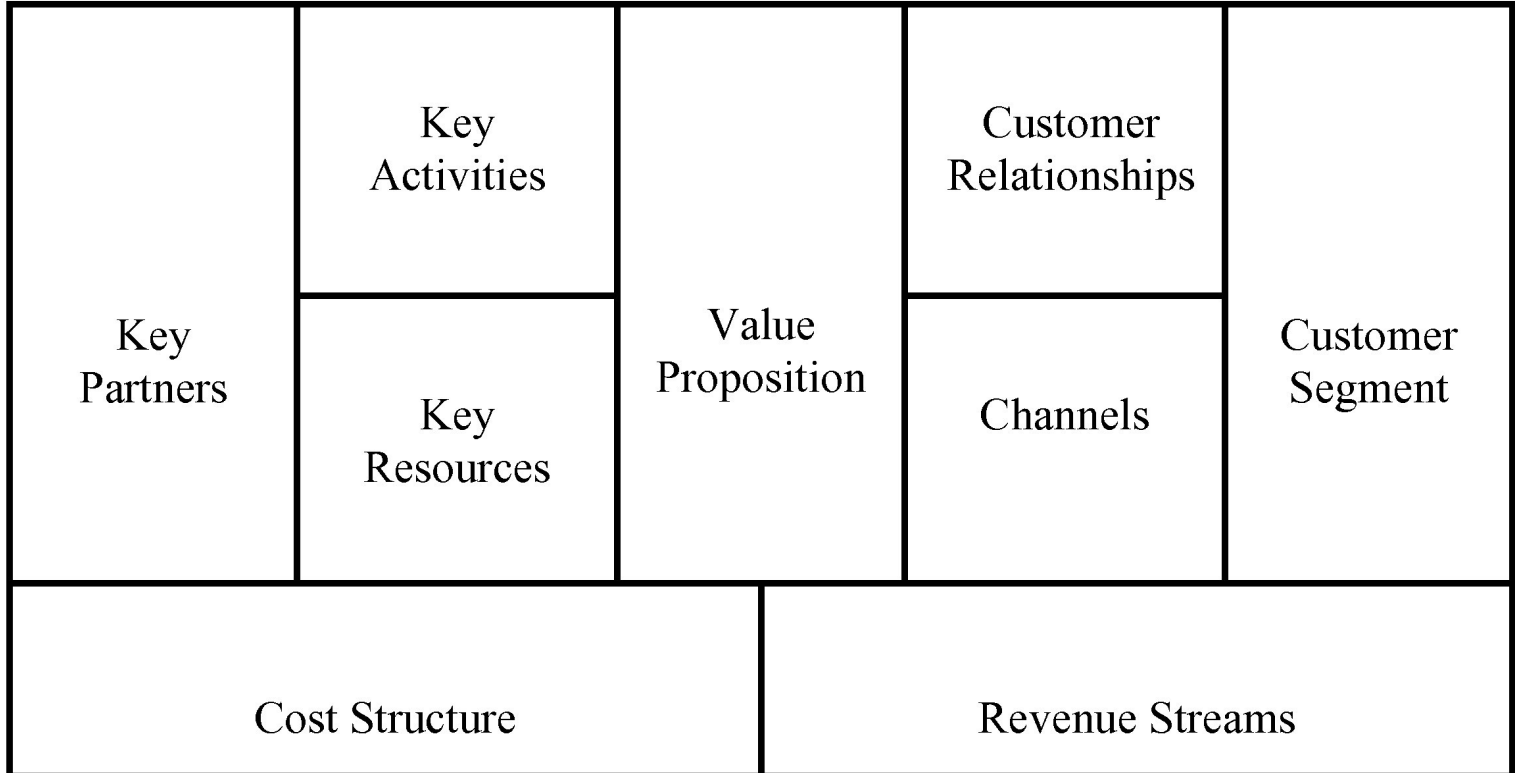
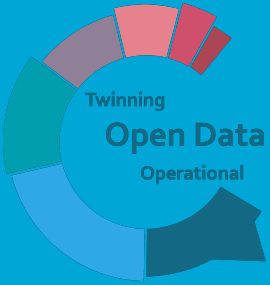
**Value
architecture**

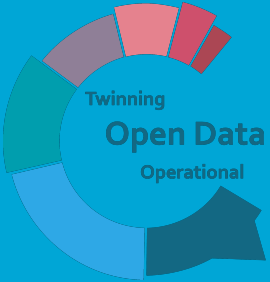
a. Cost model
b. Revenue model

CHANGES IN LEGISLATION
e.g. Antitrust and privacy legislation

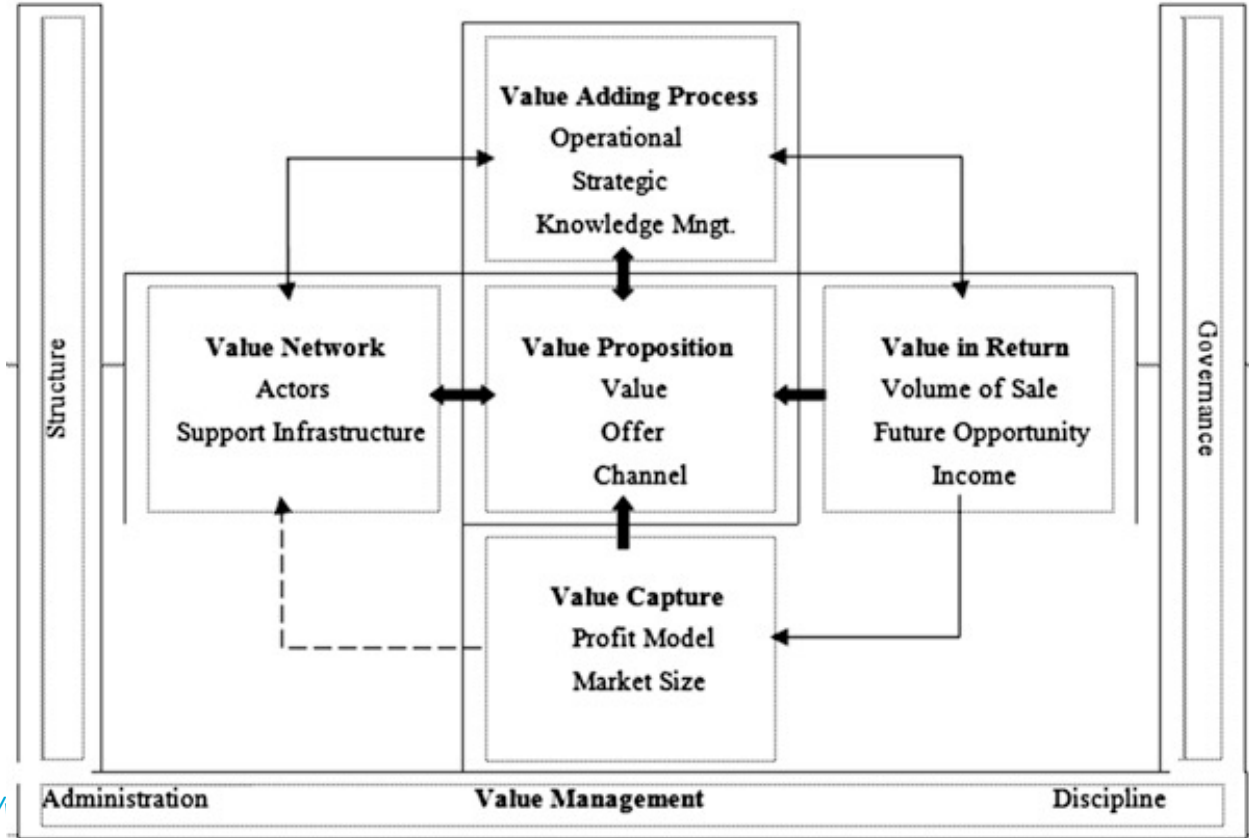


Business model canvas (Osterwalder & Pigneur 2010)





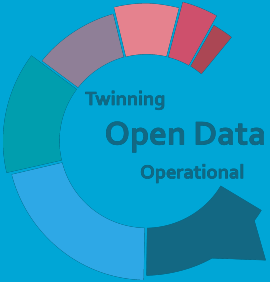
6-Value framework (Zeleti & Ojo 2016)



<http://>

Common value components

1. *Value proposition*: specifies the value that is delivered and offered to different stakeholders.
2. *Value creation*: refers to the execution of particular actions to generate the desired value.
3. *Value capture*: the process of retaining some part of the value produced in the value adding process



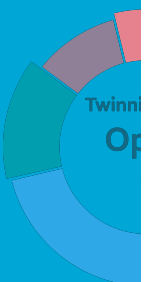
Triple bottom line business model canvas

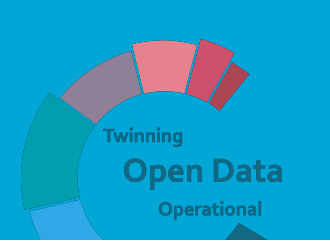
Key Partners	Key Activities	Value Proposition	Customer Relationships	Beneficiaries
	Key Infrastructure & Key Resources		Channels / Deployment	
Budget costs		Revenue Streams		
Environmental costs		Environmental Benefits		
Social costs		Social Benefits		

Mission Statement 2: Connection of Wheatley Group owned Drygate Housing to the Tennents Brewery heating system to provide low carbon and low cost heating to an area of fuel poor residents, demonstrate connection of external customers to a private sector heating network.

<p>Key Partnerships The key partnership is between the Tennents Caledonian Brewery (TCB) [heat generator] and The Wheatley Group (TWG) [heat consumer]</p>	<p>Key Activities Installation of connecting heat network. Removal of existing dry heating system, installation of new wet system, creation of back up energy centre, Establishment of contractual relationship</p>	<p>Value Proposition The connection will allow for the provision of low cost, low carbon heat to residents in the city who suffer from extreme fuel poverty.</p>	<p>Buy in & Support TWG – Senior management, legal, technical, governance, financial. TCB – Senior management, technical, financial.</p>	<p>Beneficiaries TWG will benefit from low carbon, low cost heat, as well as meeting housing and building standards. TCB will benefit from reputational value. City wide benefit from increase to GVA and demonstration of successful connection facilitating further connections, reduction in fuel poverty</p>
<p>Budget Costs Installation of pipe network in roads, removal of dry heating system, installation wet of distribution network in housing, creation of TCB energy centre, creation of TWG back up energy centre.</p>		<p>Revenue Stream Without an ESCo, revenue from heat sales would go to TCB. With an ESCo, a surplus on revenue could be generated for future growth of DH.</p>		
<p>Environmental cost No notable impacts from project outside of temporary impacts resulting from construction/installation.</p>		<p>Environmental Benefits TCB expect to reduce CO₂ emissions as a result of Gas CHP. TWG expect to see improved living conditions for residents and reduced CO₂ emissions.</p>		
<p>Social Cost No notable impacts from project outside of temporary impacts resulting from construction/installation.</p>		<p>Social Benefits Improved living conditions and life expectancy of residents through alleviation of fuel poverty.</p>		

Source: Sheombar et al. (2020), p.54

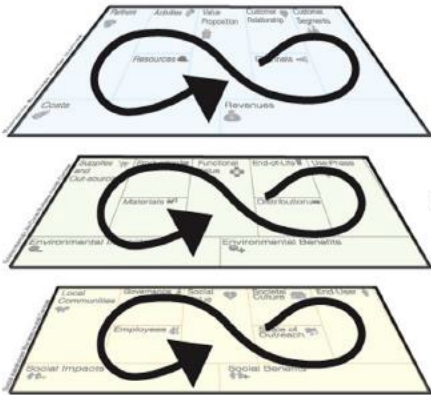




Triple layered business model canvas

Horizontal coherence

Vertical coherence



economic layer

environmental layer

social layer

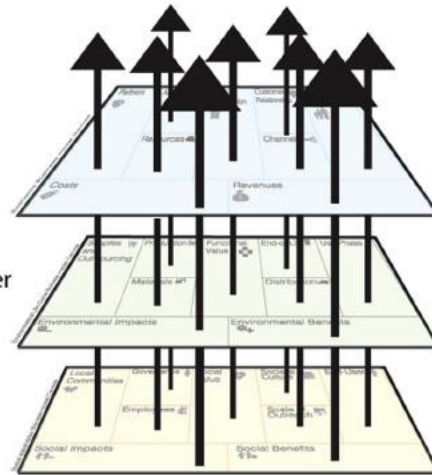
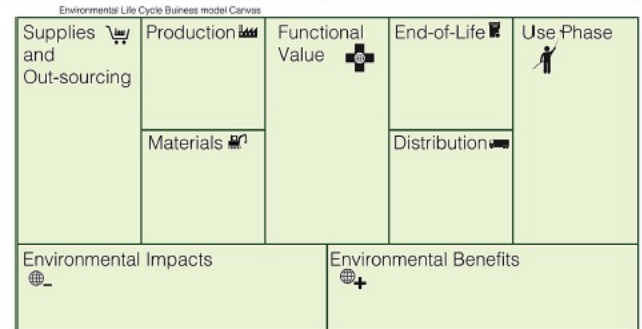
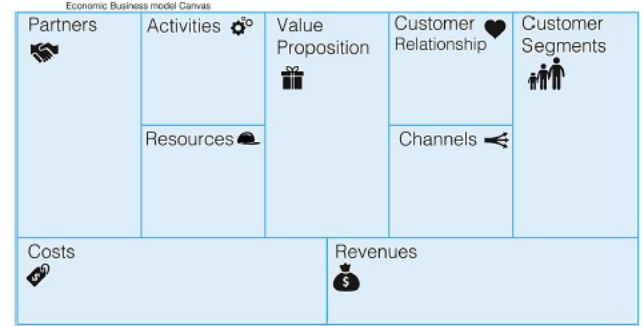


Fig. 4. The triple layered business model canvas creates two new dynamics: horizontal and vertical coherence.



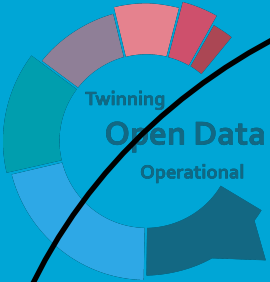
Example of a triple bottom line business model canvas for a data platform

Mission Statement Urban Data Platform: Create public and private value through ecosystem matchmaking

<u>Partners</u>	<u>Platform Activities</u>	<u>Value Proposition</u>	<u>Guiding Public Values</u>	<u>Customers, Users & Participants</u>
Investor Owner Manager	Tools & svcs, Matching, Audience building, Rules and standards	"Space" for galvanizing innovation, participation, collaboration, co-creation and public and private value creation	Platform purpose that engages all stakeholders	Citizens, Communities
Technology Partner	<u>Platform Data Assets</u> Data-gathering, data quality assurance, visualisation, AI/analytics			
(Social) Media Partner	<u>Key Infrastructure & Resources</u>			
Subcontractor	Digital, Physical, Monetary, People, IP, Brand			
<u>Financial Cost</u> E.g. financial investments, run costs		<u>Financial Benefit</u> E.g. ROI, revenue streams, economic growth		
<u>Social Cost</u> E.g. privacy, security, freedom, personal attention invested		<u>Social Benefit</u> E.g. democratic participation, fairness, liveability, happiness		
<u>Environmental Cost</u> E.g. CO ₂ footprint, natural resources used (by ecosystem)		<u>Environmental Benefit</u> E.g. sustainable innovation, reduced emissions, less waste		

Source:
Sheombar
et al.
(2020),
p.56

Open data revenue models (Ferro & Osella 2013)



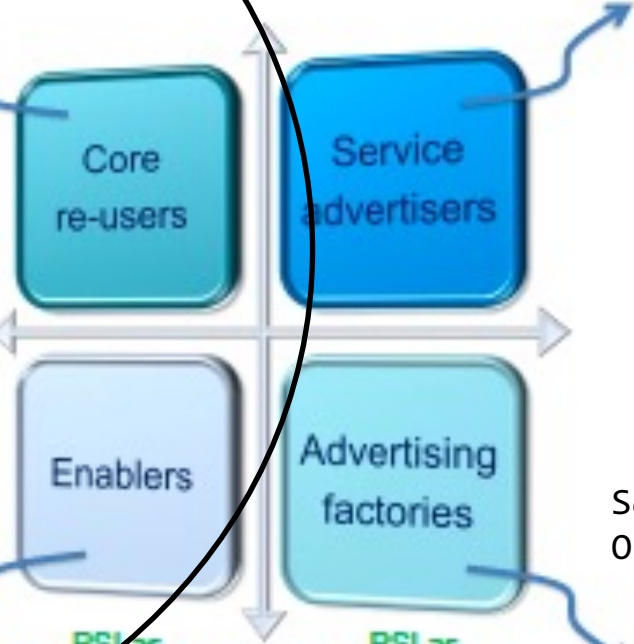
- #1 Premium Product / Service
- #2 Freemium Product / Service
- #3 Open Source Like

#7 Free as Branded Advertising

On the front line

Position in the value creation process

Behind the scene



PSI as "bread and butter" PSI as "attraction tool"

- #4 Infrastructural Razor & Blades
- #5 Demand-Oriented Platform
- #6 Supply-Oriented Platform

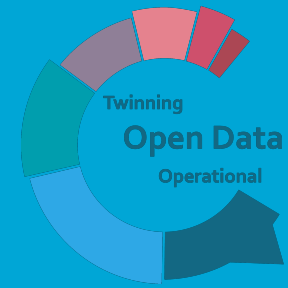
#8 White-Label Development

Strategic vision of the PSI realm

Source: Ferro & Osella 2013, p. 2

Pricing mechanisms

- Utility / on-demand / pay-as-you-go
 - Fee for actual use per area / size / session
- Subscription
 - Periodic fee in advance, (un)limited use thereafter
- Community
 - Users invest time and effort
- Advertising
- Sponsorship



Open data organization categories

1. Data providers

- Organizations that provide data or services

2. Data enablers

- Organizations that assist other organizations in managing, publishing and using data

3. Data end-users

- Use open data to support their primary processes

Value propositions for open data providers

- *Indirect benefits*: release data to support primary goal(s) of the organization. OD to lead to stimulate economic value, transparency, etc.
- *Cost savings*: release data to lead to internal cost avoidance, efficiency gains and/or increase the quality of data through user participation
- *Additional fee-based services*: Infrastructural Razor & Blades, Open Source Like, Freemium, Premium



PSI collection

PSI
modelling

PSI quality
control

PSI
presentation

PSI
distribution

PSI (re)use

Categories of open data enablers

Enablers / brokers / intermediaries / infomediaries

1. *Supply facilitators*: provide technologies/ services to data providers, sometimes including data management/ data curation
2. *Access facilitators*: support data users to access data from different sources by e.g. aggregation, harmonization, structuring
3. *Service creators*: provide a service/ specific application/ tailor-made solutions to certain target groups

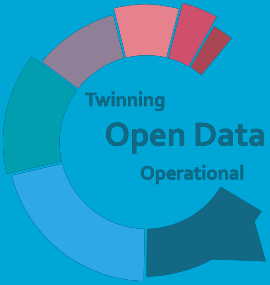
Smart City Business Models (1/2)

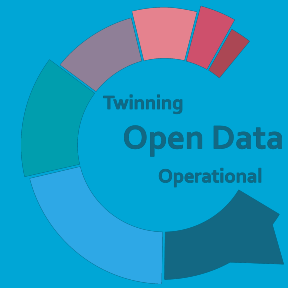
Business Model A: Data for sale

- Monetizing internally generated data or crowdsourced data (e.g. via sensors, mobile phones)
- Monetizing data generated for a specific purpose for new purposes

Business Model B: Data collection and aggregation as a Service

- Big (open) data scrubbed and processed for end-users





Smart City Business Models (2/2)

Business Model C: Data use and analytics as a Service

- Data are collected and analysed to answer specific questions in a B2B, B2C or P2P environment
 - Way-finding apps
 - Energy transition decision-making, e.g. neighbourhood scans

Business Model D: multi source data mash-up and analysis

- Enrichment of data provided by clients with data from other (open) sources
 - Data-driven cycling app, tailored to the local context



Categories of open data end-users

Use open data products to support primary tasks

1. *Public sector:*

- provide public services
- decision-making processes
- Internal efficiency / effectiveness

2. *Private sector:*

- augment business capabilities
- internal efficiency / effectiveness



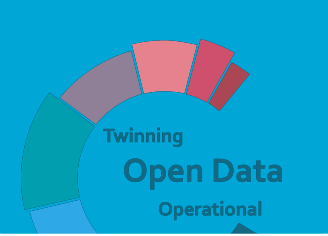
Summary for open data providers

Business model	Value proposition	Value creation	Value capture
<i>Data providers for indirect benefits</i>	Open data supporting strategic business objectives	Publishing data	Improved outcomes of the organizations Lack of direct revenues compensated through other funding sources
<i>Data providers for cost savings</i>	Availability of higher quality data	Publishing data Cleaning data	Improved process and data Cost-savings
<i>Freemium data providers</i>	Availability of limited data for free and high quality data and data services at some cost	Publishing data Data maintenance More sophisticated data access services	Revenue from added value services
<i>Premium data providers</i>	High quality data at some cost Data meeting particular user needs at some cost	Publishing data Data maintenance Data visualization services Data analysis and interlinking services	Revenue from all data and advanced data services



Summary for open data enablers

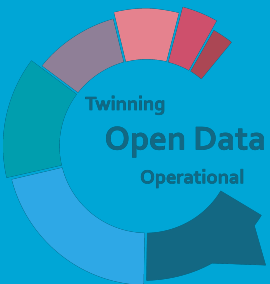
Business model	Value proposition	Value creation	Value capture
<i>Supply facilitators</i>	Facilitating in providing access to geographic data resources, through provision of technologies and/or services	Publishing data Harmonizing data Metadata creation (Basic) data visualization and analysis services	Revenues from selling services or products to data providers (different revenue and pricings models can be adopted)
<i>Access facilitators</i>	Facilitating in access to geographic data resources, through provision of technologies and/or services Access to combined and/or integrated data resources	Structuring and classifying data Aggregating data (Basic) data visualization and analysis services	Revenues from selling services or products to data users (different revenue and pricings models can be adopted)
<i>Service creators</i>	Diversity of tailored solutions on top of geographic data	Creating applications and other solutions on top of geographic data	Revenues from selling solutions to different kind of end-users Revenues from developing solutions at the request of data providers

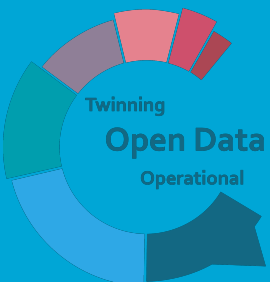


Summary for open data end users

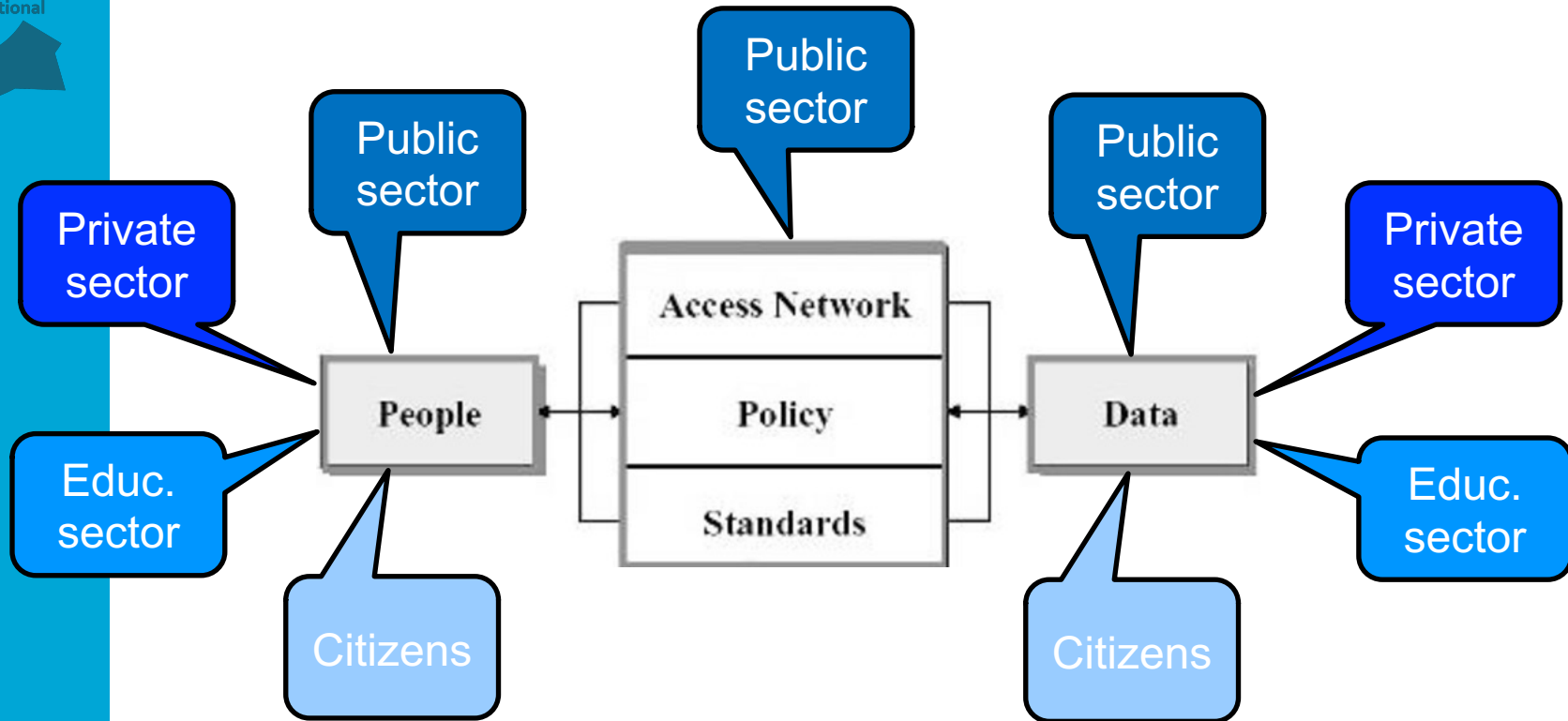
Business model	Value proposition	Value creation	Value capture
<i>Data users</i>	No common value proposition, because of diversity of public and private organizations that can be considered as users	Data used within organizational processes and activities, value mainly created through use of data in key processes of the organization	Improved business processes and outcomes. Revenues from main products and services delivered by the organization

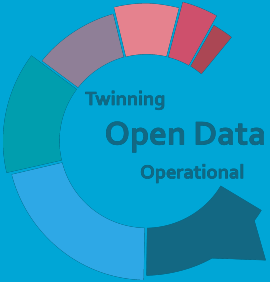
Future developments



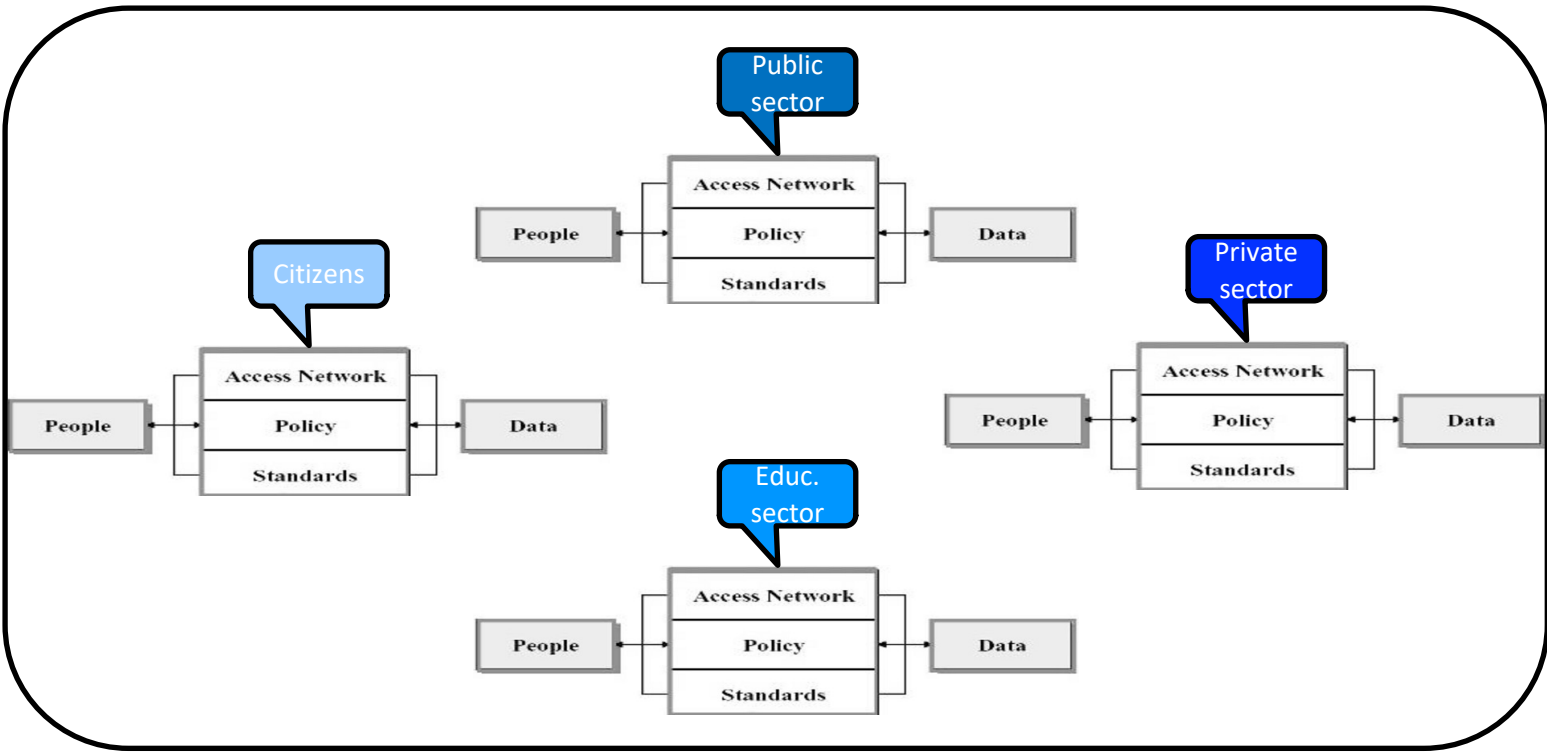


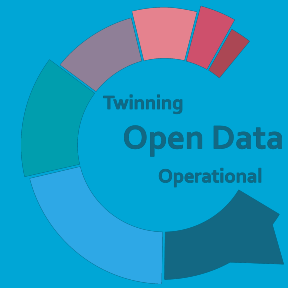
From platforms to ecosystems





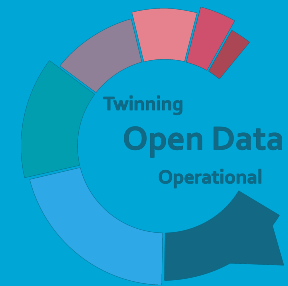
From ecosystems to an ecosystem of ecosystems





Implications for business models

1. From isolated business models to an ecosystem of business models
2. From concrete business models to adaptive business models
3. Triple Helix + citizens
4. Data governance & data ethics become more urgent
5. Trust building and capacity building are essential



Thank you for your attention



TODO project: This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement Number 857592 - TODO

For more information about the project, see <https://todo-project.eu/>

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